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Reply on RC1

Kenta Tozato et al.

Author comment on "Rapid tsunami force prediction by mode-decomposition-based surrogate modeling" by Kenta Tozato et al., Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2021-77-AC1>, 2021

Thank you for your valuable comment.

This study mainly aims to present a framework for instant tsunami prediction using a reliable surrogate model and to demonstrate its potential by numerical examples. As you pointed out, it is important to consider the effect of building destruction in the risk evaluation of tsunami run-up. However, as you may know, the failure of buildings caused by the tsunami force can hardly be simulated in itself, since relevant numerical methods have not been fully developed yet or, equivalently, are not available. In addition, even if we had them at hand, the results would be unreliable in most actual situations because the input parameters and analysis conditions involve lots of uncertainties. If the validity of the calculation results cannot be guaranteed, the corresponding surrogate model does not make sense. Therefore, we think that this is hardly the time for considering the effects of the building destruction in the proposed framework. Nevertheless, continued challenges must be tackled both in simulating failure due to the tsunami force and in constructing a surrogate model in consideration of the simulation results. These are left to future work.